To: Garcia, David[Garcia.David@epa.gov]
From: McCoy, Melinda
Sent: Mon 8/10/2015 5:11:56 PM
Subject: FW: USGS report with baseline concentration ranges for metals in soils in San Juan Basin
USGS WRIR No. 98-4213.pdf

As requested, second email from Sunday…

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From: McCoy, Melinda
Sent: Sunday, August 09, 2015 11:29 AM
To: Turner, Philip; Rauscher, Jon
Cc: Restivo, Angela; Nelson, Russell
Subject: USGS report with baseline concentration ranges for metals in soils in San Juan Basin

Hi Philip and Jon,

Table 14 on page 59 of the attached USGS report (copied and pasted below) may be of particular interest. Discussion of Table 14 begins on page 61 of the report (see excerpt below). The table

provides baseline concentration ranges for several trace elements in soils, along with concentration ranges found in NIWQP samples collected in 1993-1994. I thought the San Juan Basin baseline values in Table 14 might be particularly relevant. I found this 1998 USGS report on the following FWS website: http://www.fws.gov/southwest/sjrip/DR_WQC.cfm

Inorganic Constituents in Bottom Sediment and Soil

Geochemical baseline values for selected trace elements in western soils have been compiled by several researchers. Shacklette and Boerngen (1984) presented a baseline range for concentrations of arsemc, chromium, copper, lead, mercury,

molybdenum, mckel, selenium, strontium, uranium, vanadium, and zinc in soils of the United States west of the 97th parallel (table 14). Concentrations of the previous 12 elements in 47 soil samples collected in the San Juan Basin are presented by Severson and Gough (1981) and summarized by Ebens and Shacklette (1982) (table 14). The central 95 percent of the observed concentrations is called the western soils, baseline range in table 14. These values are considered the geochemical baseline values for the study area.

Table 14.--Baseline concentration ranges for selected trace elements in soils and concentration ranges for National Irrigation Water Quality Program (NIWQP) samples, 1993-94

[All values are in micrograms per gram; <, less than]

Element	Western soils, baseline range[1]	San Juan Basin soils, baseline range[2]	Study area, bottom-sediment range	Study area, soils range
Arsenic	1.2 - 22	2.3 - 13	2.2 - 7.1	3.4 - 8.0
Chromium	8.5 - 200	7 9 - 41	2 - 58	3 - 59
Copper	4.9 - 90	2.3 - 33	2 - 31	3 - 27
Lead	5.2 - 55	6.5 · 22	4 - 58	10 - 24
Mercury	0.0085 - 0.25	0.01 · 0.07	<0.02 - 0.03	<0.02 - <0.02
Molybdenum	0.18 - 4.0	0.4 3.5	<2 - 26	<2 - 2
Nickel	3.4 - 66	3.1 24	2 - 24	4 - 26
Selenium	0.039 - 1.4	0.03 0.77	<0.1 - 23	<0.1 - 3.6
Strontium	43 - 930	85 410	130 - 2,600	130 - 360
Vanadium	18 - 270	18 - 110	8 - 110	10 - 140
Zinc	17 - 180	15 100	9 - 380	11 - 88

[1]Central 95 percent of observed concentrations (Shacklette and Boerngen, 1984).
[2]Central 95 percent of observed concentrations (Severson and Gough, 1981, Ebens and Shacklet 1982).

Thanks,

Melinda

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